

## Table of contents

List of contributors	xiii
<b>Invited Papers</b>	
CFD applications to the aero-thermodynamics of turbomachinery. <i>P. Stow</i>	1
Computational fluid dynamics in the automobile industry. <i>A. D. Gosman</i>	25
Developments in the calculation of unsteady turbomachinery flow. <i>M. B. Giles</i>	45
Efficient solution of the steady Euler equations with a centered implicit method. <i>A. Lerat and J. Sidès</i>	65
Some current trends in numerical grid generation. <i>J. F. Thompson</i>	87
A strategy for the use of hybrid structured-unstructured meshes in computational fluid dynamics. <i>N. P. Weatherill</i>	101
Implicit methods in CFD. <i>T. H. Pulliam</i>	117
The cell vertex method for steady compressible flow. <i>K. W. Morton, P. N. Childs, and M. A. Rudgyard</i>	137
Multigrid, defect correction and upwind schemes for the steady Navier-Stokes equations. <i>P. W. Hemker and B. Koren</i>	153

Recent developments of the Taylor–Galerkin method for the numerical solution of hyperbolic problems. <i>J. Donea, V. Selmin, and L. Quartapelle</i>	171
Numerical grid generation in 3-D Euler-flow simulation. <i>J. W. Boerstel</i>	187
An approach to geometric and flow complexity using feature-associated mesh embedding (FAME): strategy and first results. <i>C. M. Albone</i>	215
Lax-stability vs. eigenvalue stability of spectral methods. <i>L. N. Trefethen</i>	237
Acceleration of compressible Navier–Stokes flow calculations. <i>M. O. Bristeau, R. Glowinski, B. Mantel, J. Périaux, and G. Rogé</i>	255

### Contributed Papers

Steady incompressible and compressible solution of Navier–Stokes equations by rotational correction. <i>F. El Dabaghi</i>	273
Comparison of implicit methods for the compressible Navier–Stokes equations. <i>Y. Marx and J. Piquet</i>	282
Implicit finite difference methods for computing discontinuous atmospheric flows. <i>M. J. P. Cullen</i>	289
Numerical simulation of unsteady flows using the MUSCL approach. <i>P. Guillen, M. Borrel, and J. L. Montagne</i>	296

- Computation of viscous separated flow using a particle method. 310  
*J. M. R. Graham*
- A streamwise upwind algorithm for the Euler and Navier–Stokes equations applied to transonic flows. 318  
*P. M. Goorjian*
- Computation of diffracting shock wave flows. 325  
*R. Hillier*
- Multiple mesh simulation of turbulence. 332  
*P. R. Voke*
- Some experiences with grid generation on curved surfaces using variational and optimisation techniques. 341  
*C. R. Forsey and C. M. Billing*
- Adaptive orthogonal curvilinear coordinates. 353  
*R. Arina*
- An approximate equidistribution technique for unstructured grids. 360  
*P. K. Sweby*
- Multiblock techniques for transonic flow about complex aircraft configurations. 367  
*S. E. Allwright*
- Cartesian grid methods for irregular regions. 375  
*R. J. LeVeque*
- Numerical characteristic decomposition for compressible gas dynamics with general (convex) equations of state. 383  
*P. Glaister*
- A hybrid scheme for the Euler equations using the Random Choice and Roe's methods. 391  
*E. F. Toro and P. L. Roe*

A variational finite element formulation for three-dimensional incompressible flows. <i>P. Ward, R. Desai, W. Kebede, and A. Ecer</i>	403
A comparison of multigrid methods for the incompressible Navier–Stokes equations. <i>S. Sivaloganathan, G. J. Shaw, T. M. Shah, and D. F. Mayers</i>	410
Multigrid calculations of jet flows. <i>S. A. E. G. Falle and M. J. Wilson</i>	418
The accurate approximation and economic solution of steady-state convection dominated flows. <i>P. H. Gaskell, A. C. K. Lau, and N. G. Wright</i>	425
A 3D finite element code for industrial applications. <i>J. P. Chabard and O. Daubert</i>	432
The behaviour of Flux Difference Splitting schemes near slowly moving shock waves. <i>T. W. Roberts</i>	442
A Total Variation Diminishing scheme for computational aerodynamics. <i>D. M. Causon</i>	449
Properties of two computational methods for shallow water flow problems. <i>Th. L. van Stijn, P. Wilders, G. A. Fokkema, and G. S. Stelling</i>	458
Consistent boundary conditions for cell centred upwind finite volume Euler solvers. <i>H. Deconinck and R. Struys</i>	464
An optimistic reappraisal of computational techniques in the supercomputer era. <i>G. Moretti</i>	471

Evaluation of a parallel conjugate gradient algorithm. <i>R. W. Leland and J. S. Rollett</i>	478
Mixed finite elements for highly viscoelastic flows. <i>J.-M. Marchal</i>	484
Multiphase flow—a self consistent approach. <i>D. F. Fletcher and A. Thyagara</i>	492
Chebyshev collocation methods for the solution of the incompressible Navier–Stokes equations in complex geometries. <i>T. N. Phillips and A. Karageorghis</i>	500
Far field boundaries and their numerical treatment: an unconventional approach. <i>S. Karni</i>	507
Moving element methods for time dependent problems. <i>M. J. Baines</i>	513
Non-existence, non-uniqueness and slow convergence in discrete conservation laws. <i>P. L. Roe and B. van Leer</i>	519